

III. REMARKS

Claims 1-5, 7-11, 13-17, 19, 20, 22, 24-28 and 37 are pending.

Claims 1-5, 7-10, 13 and 37 are patentable under 35 USC 103(a) over Mages (US 5772386) and Maydan (US 5882165). Claim 1 recites the buffer transport is operative for moving the substrate magazine between a first position and a second position, wherein when in the first position the substrate magazine is located on a magazine support and communicates with the aperture, and when moved to the second position the substrate magazine is offset from the first position and is buffered adjacent the aperture while remaining on the magazine support, and wherein the first and second positions are horizontally coplanar. The combination of Mages and Maydan does not disclose or suggest these features.

It is acknowledged in the office action that Mages does not disclose or suggest that the first and second positions are horizontally coplanar. However, it is asserted that Maydan discloses this feature citing to reference numerals 26, 28 and 24, 30.

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). It is respectfully submitted that combining Maydan with Mages would result in an inoperable combination.

Maydan discloses an external cassette elevator 24 adapted for holding a multiplicity of cassettes 26, 28, in a vertical position. The external cassette elevator assembly 24 comprises a first horizontal base plate 30 that is mounted on guide shafts

32, 34 for reciprocal horizontal indexing movement to selectively position each cassette directly opposite and aligned with load lock chamber entrance slit or opening 36. (Col. 4, L. 31-40). There is absolutely no disclosure or suggestion in Maydan of any travel of the plate 30 toward the opening 36. As can be seen in Figure 2 of Maydan, such movement is not permitted as the wafers 15 in the cassettes 26, 28 would collide with the doors 38 (if the door is open) or not permit the door 38 to pivot to its open configuration (if the door is closed).

Taking horizontal base plate 30 of Maydan and combining it with Mages would remove the motion of the platform 7 of Mages along plane 10. This combination would effectively eliminate any coupling between the container 6 and shield 11 in Mages for sealing the opening during loading and unloading of the disk shaped objects to and from the container 6. The inability to effect the seal 11 prohibits maintaining the clean room environment of Mages (see Mages, Col. 5, L. 4-7).

Furthermore, it is submitted that if Maydan were combined with Mages, the principle operation of Mages would be significantly changed. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

In Mages a gripper 53 which is moveable vertically and horizontally (by horizontal drive 55 and elevator 56) is used to lift the transporting containers 46 off stationary storage shelves 45 and transfer the containers for manually loading or removal from the storage through the lockable loading opening 50 (Col. 6, L. 16-32; Fig. 10) and vice versa. In Mages after the

transport container 46 is grasped, it is transported horizontally from the storage shelf 45 into the open space 47 and is then transported vertically up to a plane which corresponds to the ergonomic height for manually charging the storage or to a plane for charging a platform of the loading and unloading device (Col. 6, L. 27-32). Inserting the plate 30 of Maydan into the device of Mages would render the vertical travel of the gripper 53 virtually impossible as the side by side arrangement of the cassettes 26, 28 would effectively block the open space 47 of Mages. Alternatively, if the plate 30 of Maydan is located so that one cassette 26, 28 is located in front the loading/unloading opening in Mages and the other cassette 26, 28 is located under the stack of shelves 45 of Mages access to a portion of the plate 30 would be blocked if a cassette is located at the loading/unloading location of Mages. Moreover, the plate 30 of Maydan would not be able to move horizontally if placed in the device of Mages to position the two cassettes 26, 28 in front of the loading/unloading location as the whole plate 30 must move. As can be seen in Mages the device will not allow such movement of the plate 30. In order to allow such movement the device in Mages would have to be significantly redesigned and made larger to accommodate the travel of the plate 30 which contradicts the Examiner's reasoning for combining the references, i.e. "to have the magazines on a common magazine support and buffered from a first to a second horizontally coplanar position (providing another different direction of movement) adjacent the aperture while remaining on the magazine support in order to have a more compact device."

Mages operates as a vertical storage having storage shelves (arranged one above the other) on one side of the housing (44) and a space (47) located on the other side of the housing (44) to

allow for the transport of containers to and from the vertically arranged storage shelves (45). (Col. 5, L. 61 - Col. 6, L. 33). The gripper (53) in Mages is used to transport the container from one side of the housing (44) to the other by picking the containers off of the shelves (45), moving them through the space (47) and placing the containers at the charging platform (52) or the loading opening (50) so that the housing has a width equal to only two containers. Substituting the gripper (53) with the horizontal base plate (30) of Maydan to allow for horizontal buffering of the containers would increase the width of the housing to at least the width of four containers arranged side by side (the storage shelf width increases and the width of the space (47) in Mages increases to allow for the passage of the base plate (30) of Maydan).

Further, the base plate (30) of Maydan would not be capable of moving vertically within the housing (44) of Mages if the two references were combined such that the containers can be transported to the storage shelves (45) in the manner described in Mages. In essence if the two references were combined the gripper (53) of Mages would essentially comprise the horizontally moveable base plate (30) of Mayden such that the entire base plate (30) is transported vertically in the space (47) so a number of base plates (30) can be stacked. Each base plate would have to have its own transport mechanism (unless the base plates are picked off of a storage shelf in the manner described for each individual container in Mages). This in and of itself would substantially increase the size of the housing (44) in that the space (47) as well as the storage areas would have to be widened to accommodate the base plate (30).

In addition the loading opening (50) and the charging platform (52) in Mages are located at an edge of the housing (see Figs. 9-11). Thus, in order to allow all of the containers located on the base plate (30) to be accessed through the loading opening (50) and charging platform (52), if Mages and Maydan were combined as suggested, the housing would have to be widened to accommodate the horizontal travel needed by the base plate (30).

Thus, one skilled in the art would not combine Mages and Maydan as suggested in the Office Action to have "a more compact device" as combining the two references would clearly result in making Mages inoperable for its intended purpose or a significant change in the principle operation of Mages.

Thus, Applicant's claim 1 is patentable for the above noted reasons. Claims 2-5, 7-10, 13 and 37 are patentable at least by reason of their respective dependencies.

Claim 11 is patentable under 35 USC 103(a) over Mages and Maydan. Claim 11 ultimately depends from claim 1 and is patentable at least by reason of its dependency.

Further, claim 11 recites that the sensor is rotatably mounted on a frame of the station such that upon removal of a door of the magazine, the sensor extends inside the magazine. Mages does not disclose how the sensor (21) is mounted as admitted by the Examiner in the Final Office Action.

All that is disclosed in Mages is that "an index sensor 21 detects the projections 18 and the disk shaped object 19 during the vertical adjustment of the transporting container 6". It would not be obvious to one skilled in the art to modify Mages to achieve what is claimed in Applicant's claim 11 without the impermissible use of hindsight because there is no disclosure or

suggestion that the sensor (21) is "rotatably mounted on a frame of the station such that upon removal of a door of the magazine, the sensor extends inside the magazine" as recited by Applicant. All that Maydan discloses is that the cassette elevator (24) is adapted by indexing system (40) for reciprocal vertical indexing movement (Col. 4, L. 42-46). There is no disclosure of sensor associated with the indexing in Maydan.

Thus, the combination of Mages and Maydan does not disclose or suggest that the sensor is rotatably mounted on a frame of the station such that upon removal of a door of the magazine, the sensor extends inside the magazine as claimed by Applicant.

As argued in Applicant's prior response rejection of claim 11 is based solely on hindsight in light of Applicant's disclosure. The Examiner asserts that the use of Applicant's specification is not using hindsight but rather "it shows that applicant has stated that the particular mounting is not important as long as the sensor can perform its job." It is respectfully noted that this is not what is recited in Applicant's specification. Page 14, lines 16-20 recite verbatim that "[i]n another embodiment, sensor 245 may be mounted in any orientation at any location so long as sensor 245 is capable of scanning substrates present inside magazine 210." The examiner also cites to *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971) for the proposition that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such as reconstruction is proper. However, the rejection made includes only knowledge gleaned from

applicant's disclosure. In attempts to justify the rejection the Examiner has only been able to recite the language in Applicant's specification as supporting the rejection and nothing else. It is further noted that, that this rejection effectively denies Applicant the use of alternative language in it's own specification to describe alternative embodiments so that proper disclosure can be made with respect to aspects of Applicant's invention.

Thus, for the above reasons, claim 11 is patentable over the combination of Mages and Maydan.

Claims 11, 14-17, 19, 20, 22 and 24-28 are patentable under 35 USC 103(a) over Mages and Gordon (US 6013920).

Claim 11 ultimately depends from claim 1 and is patentable at least by reason of its dependency. Further, claim 11 is patentable over Mages for the reasons noted above. As such, the combination of Mages with Gordon does not disclose or suggest that the sensor is rotatably mounted on a frame of the station such that upon removal of a door of the magazine, the sensor extends inside the magazine.

The Examiner argues in the Office Action that Gordon discloses "it is known to rotatably mount (clearly shown in Figure 8) the sensor on the frame and extending the sensor in the FOUP." Applicant, respectfully requests the Examiner to explicitly explain how the language "the sensor is rotatably mounted on a frame of the station such that upon removal of a door of the magazine, the sensor extends inside the magazine" of Applicant's claim 11 is disclosed in Figure 8 of Gordon.

Rotatably mounting sensors to the frame is not disclosed anywhere in Gordon. Figure 8 of Gordon clearly shows that the sensors

(86, 106) are mounted flush with a surface of the end effector (42). In Gordon the end effector (42) includes a wafer sensor (86) that is located near the top of the end effector (42) (Col. 5, L. 61-64). The end effector (42) carries the door of the FOUP (22) when the door is removed (Col. 5, L. 16-43). The wafer sensor (86) includes a left-hand and a right-hand optical detector (106) that are mounted on the end effector (42) (Col. 6, L. 19-24). The sensor (86, 106) in Gordon is only moved vertically or horizontally (Col. 4, L. 16-34). There is no disclosure or suggestion in Gordon that the sensor is "rotated" as called for in Applicant's claim 11. In Gordon, as the end effector (42) removes the door, the end effector (42) moves away from the FOUP carrying the sensor (86) away from the FOUP as well (See Figs. 4 and 5 of Gordon).

The Examiner again argues that Gordon discloses the sensor "extending" into the FOUP at column 7, lines 42-45. However this cited portion of Gordon merely recites that optical detectors (106) are located somewhere within the stack of wafers (82) carried by the FOUP (22). The Examiner is taking bits and pieces of the specification in Gordon and using them out of context. It is respectfully submitted that if the Examiner read Gordon as a whole it would be readily apparent that the sensor (86, 106) which are located on the end effector (42) cannot be extended into the FOUP as the Examiner suggests. Column 7, lines 20-42 in Gordon clearly describes the wafer detection using sensors (86, 106). In particular as the end effector (42) begins descending into the covers (78) optical detectors (106) independently detect reflection of light from a fiducial reflector (134). After collecting the Z-axis coordinates for the bottom edge of the fiducial reflector (134), the digital computer program then stops collecting data until the wafer sensor (86) descends into the

region of the stack of wafers (bearing in mind that the sensor 86, 106 is moving only in a vertical direction along with the end effector as the door is removed as described above). Upon entering the region of the stack of wafers (82) the digital computer program resumes collecting Z-axis data at locations where the reflection of the beams of light (122) changes. Thus, when the portion of Gordon relied on by the Examiner in making the rejection (i.e. the optical detectors 106 are located somewhere within the stack of wafers (82) carried by the FOUP 22) is read along with its associated text it is absolutely clear that the detectors (86, 106) are not rotated into the FOUP but merely travel in a downward vertical direction next to (i.e. outside) the FOUP in a vertical region that corresponds to the stack of wafers while the door of the FOUP (22) is being removed.

There is simply no disclosure or suggestion in Gordon that the sensor (86) "extends inside the magazine" as recited in claim 11.

Thus, claim 11 is patentable over the combination of Mages and Gordon because their combination does not disclose all the features of claim 11.

Claim 14 recites that the fluidic magazine door drive comprises an encoder for determining the vertical position of the sensor. The combination of Mages and Gordon does not disclose or suggest this feature.

Mages discloses that the lifting cylinders (32, 33) are provided for vertical adjustment and for adjusting the arm (29) relative to the wall element. The lifting cylinder is swivelable together with the support plate (34) about an axis X-X until reaching a stop (35) by means of the action of the lifting cylinder. (Col. 5, L. 29-35). Mages does not disclose "encoders" on the lifting

cylinders. It is argued in the Office Action that Mages not having an encoder on the lifting cylinders is not a limitation in the claims. It is respectfully submitted that this statement is incorrect. Applicant's claim 14 clearly states that the fluidic magazine door drive comprises an encoder. Thus, the "drive" in Mages (i.e. the lifting cylinder) does not have encoders as recited in claim 14.

It is further noted that the sensor (21) in Mages is not an encoder as recited in Applicant's claim 14. The only sensor (21) in Mages is a stationary sensor that is disclosed as detecting the projections (18) and the disk shaped objects (19) during the vertical adjustment of the transporting container (Col. 5, L. 8-10). Although Mages does not disclose how the sensor (21) is mounted, Figure 1 of Mages clearly shows that the sensor is not mounted on the closure opener (23, 29). The sensor (21) in Mages is stationary and works in conjunction with the moving elevator (5) for vertical indexing movement of the elevator (Col. 5, L. 2-10). Therefore, the sensor (21) cannot be an "encoder" of a "fluidic magazine door drive" "for determining the vertical position of the sensor" as recited in Applicant's claim 14.

Combining Mages with Gordon fails to remedy this defect.

Gordon merely discloses that the end effector (42) and the door drive mechanism (72) includes a lead screw (102) together with a stepping motor (104). Data specifying a Z-axis location for the FOUP (22) in Gordon can be obtained by counting pulses supplied to the stepper motor (104).

Thus, neither Mages nor Gordon, individually or in combination, discloses a fluidic magazine door drive that comprises an encoder for determining the vertical position of the sensor.

In Gordon the stepper motor (104) of the screw drive for opening the door is used to determine a location of the FOUP (22) and nothing more. As noted above the location of the screw drive is tracked by pulses supplied to the stepper motor (104). Therefore, the stepper motor of Gordon is not an "encoder" as called for in Applicant's claim 14.

Thus, claim 14 is patentable because the combination of Mages and Gordon does not disclose or suggest all the features of claim 14.

Moreover, one skilled in the art would not combine Mages with Gordon as suggested by the Examiner. In making the rejection of claim 14 the Examiner refers to the following features of Mages: the elevator (5) for positioning the open substrate magazine (6) and the sensor (21) for providing elevator vertical position information. However, these features do not determine the vertical position of a sensor of a fluidic magazine door drive. The sensor (21) in Mages is for indexing the movement of the elevator (5).

The end effector (42) and the door drive mechanism (72) of Gordon includes a lead screw (102) together with a stepping motor (104). The stepper motor (104) of the screw drive for opening the door is used to determine a location of the FOUP (22) and nothing more. The position of the drive for opening the door is tracked through pulses that are supplied to the stepper motor (104). Thus, there is no need to provide an "encoder" on the lead screw drive of Gordon.

The combination of Mages with Gordon is based solely on the impermissible use of hindsight in light of Applicant's disclosure as none of the features of the references cited by the Examiner

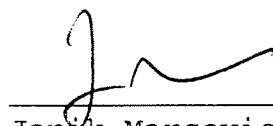
when combined disclose what is claimed by Applicant. If Mages and Gordon were combined the result would be the elevator/storage system of Mages having the lead screw door opener of Gordon and nothing more.

Claims 15-17, 19, 20, 22 and 24-28 are patentable at least by reason of their respective dependencies.

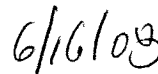
For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record, and are in proper form for allowance. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

The Commissioner is hereby authorized to charge payment for any fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,



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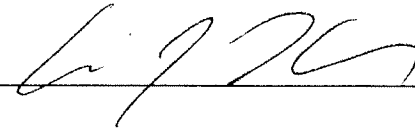
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